2007 IEPR
Overview of Natural Gas Demand in Scenario Analyses Project

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Background

- This scenario project was designed to:
  - develop a greater understanding of the actions believed to be needed to achieve major reductions in greenhouse gases (GHG) for the electricity sector,
  - Understand at least some of the consequences of these actions on generation patterns, fuel use, costs, and
  - Permit some degree of tradeoff comparisons.

Status of Analysis

- Posted project documentation
  - Main Report, Appendices, and Excel spreadsheets for detailed results
  - Two Addendum Reports
- Workshops conducted June 18 and July 9
- Further Analyses
  - Review of Additional Energy Efficiency Case(s)
  - Supplemental documentation

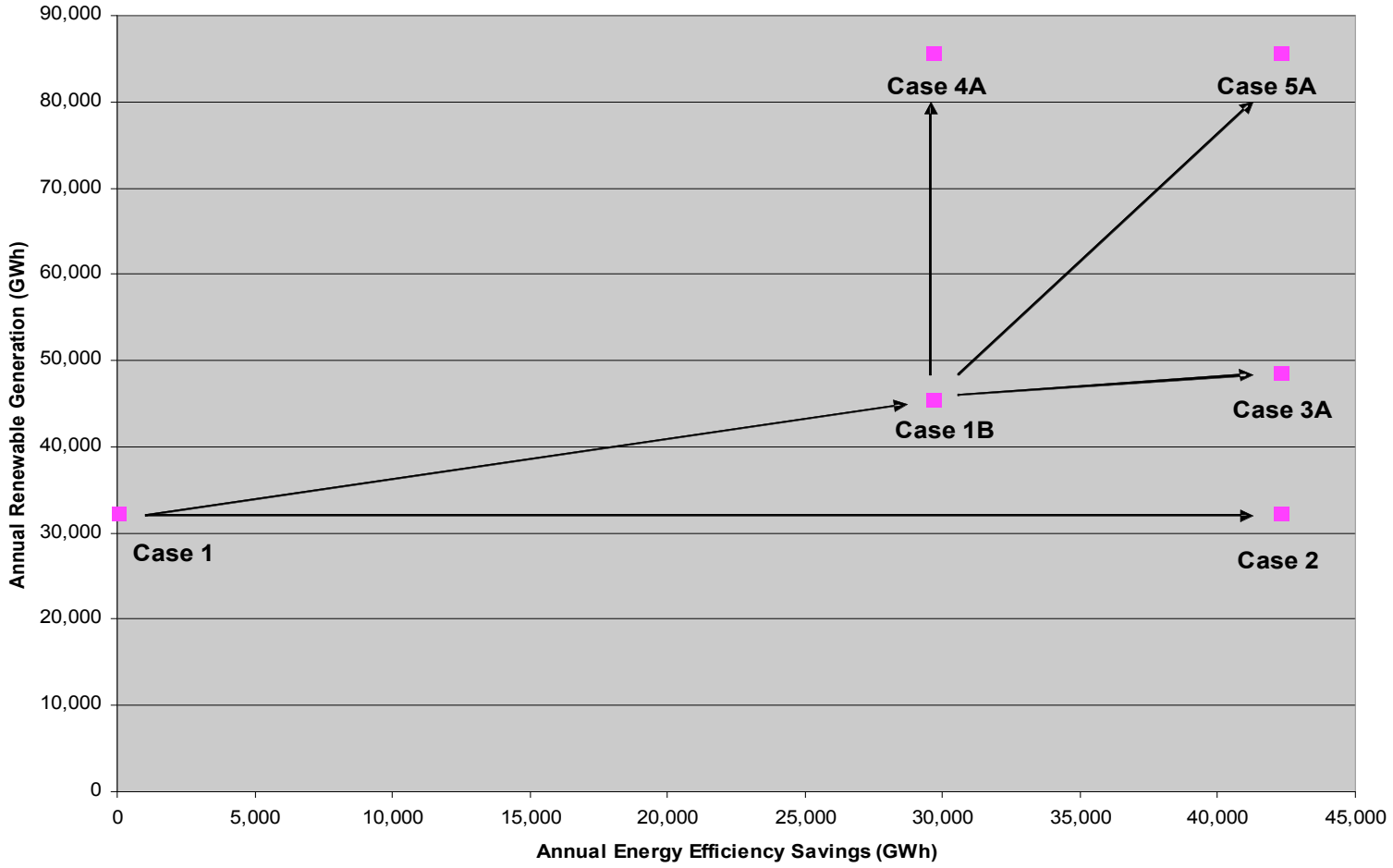
Supplemental Analyses

- Three elements of the original scope were delayed, but work is now complete or is still in process:
  - Aging power plant retirements
  - **Impacts of lower power generation fuel consumption on natural gas market clearing prices**
  - Water consumption for power generation
- As a result of the July 9 workshop, some limited additional analysis is underway

Thematic Scenarios Assessed

- Case 1 — Current conditions extended into the future.
- Case 1B — Compliance with current requirements.
- Case 2 — High sustained natural gas and coal prices.
- Case 3A — High energy efficiency in California only.
- Case 3B — High energy efficiency throughout the West.
- Case 4A — High renewables in California only.
- Case 4B — High renewables throughout the West.
- Case 5A — High energy efficiency and renewables in California only.
- Case 5B — High energy efficiency and renewables throughout the West.

Relationships Between Cases



Methodology

- Use Global Energy Decisions product called Market Analytics
  - Utilize large portions of Global's assumptions for WECC
  - Selectively replace certain elements
- Conduct power flow assessments or use other techniques to determine when/where transmission should be added
- Create integrating database for PROSYM results and additional calculations to facilitate comparisons
- Devise techniques to evaluate various sensitivity cases likely to be important to GHG emissions, costs, or reliability
- Evaluate sensitivity of results to uncertain inputs (fuel prices, "short-term shocks, etc.)
- Attempt to catalogue unquantified uncertainties

Figure 6-3: Composition of Generation to Meet California Load in 2020

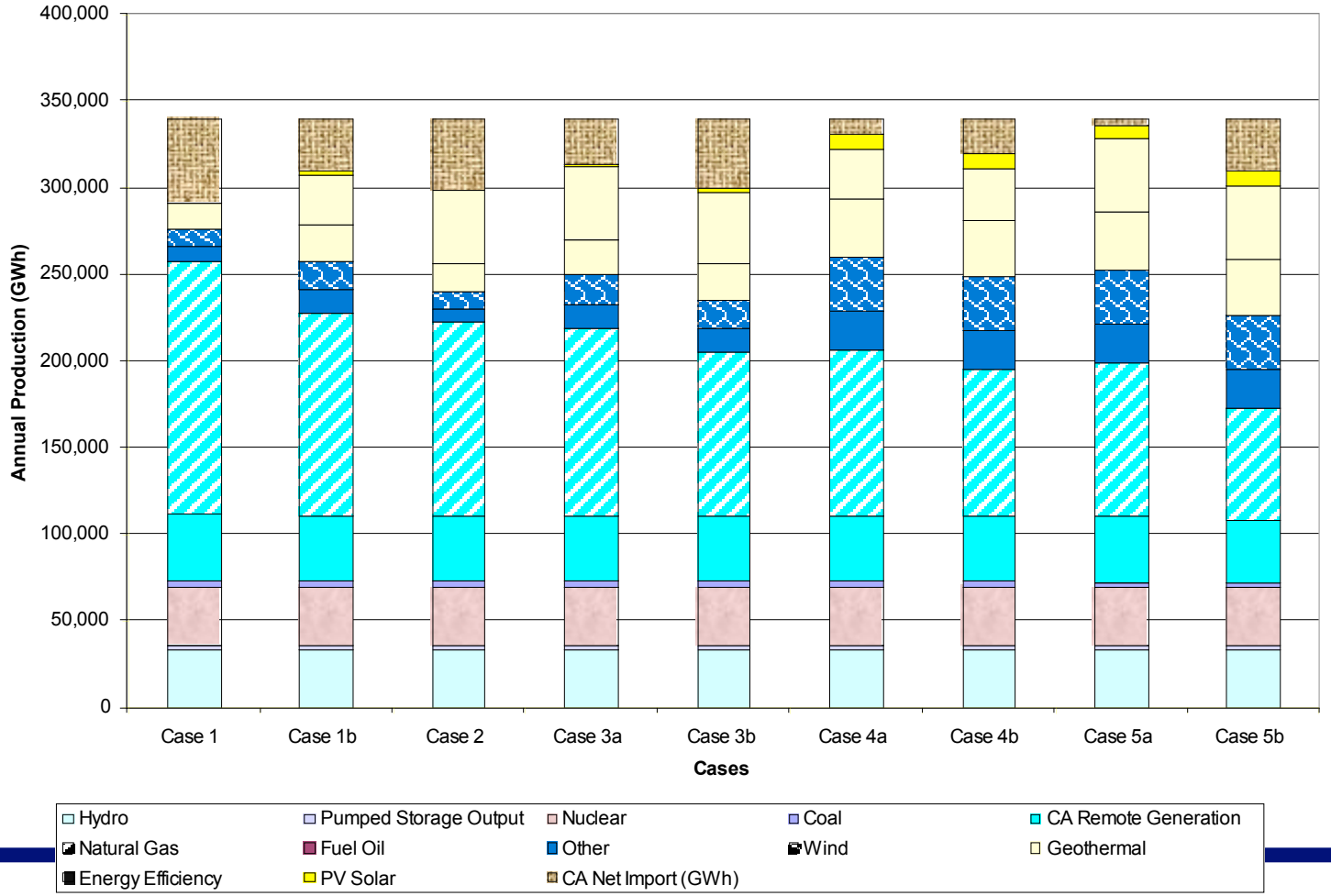
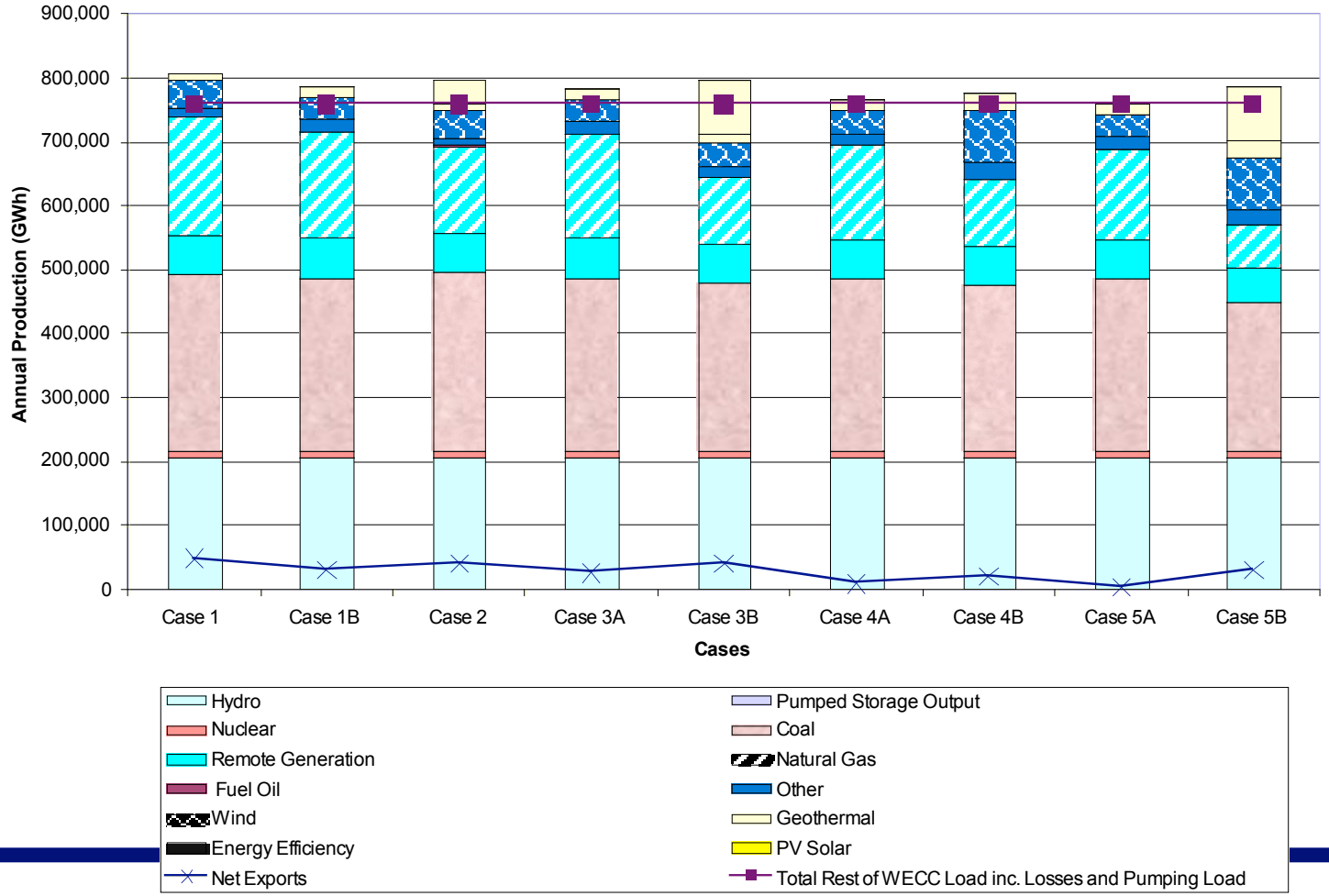
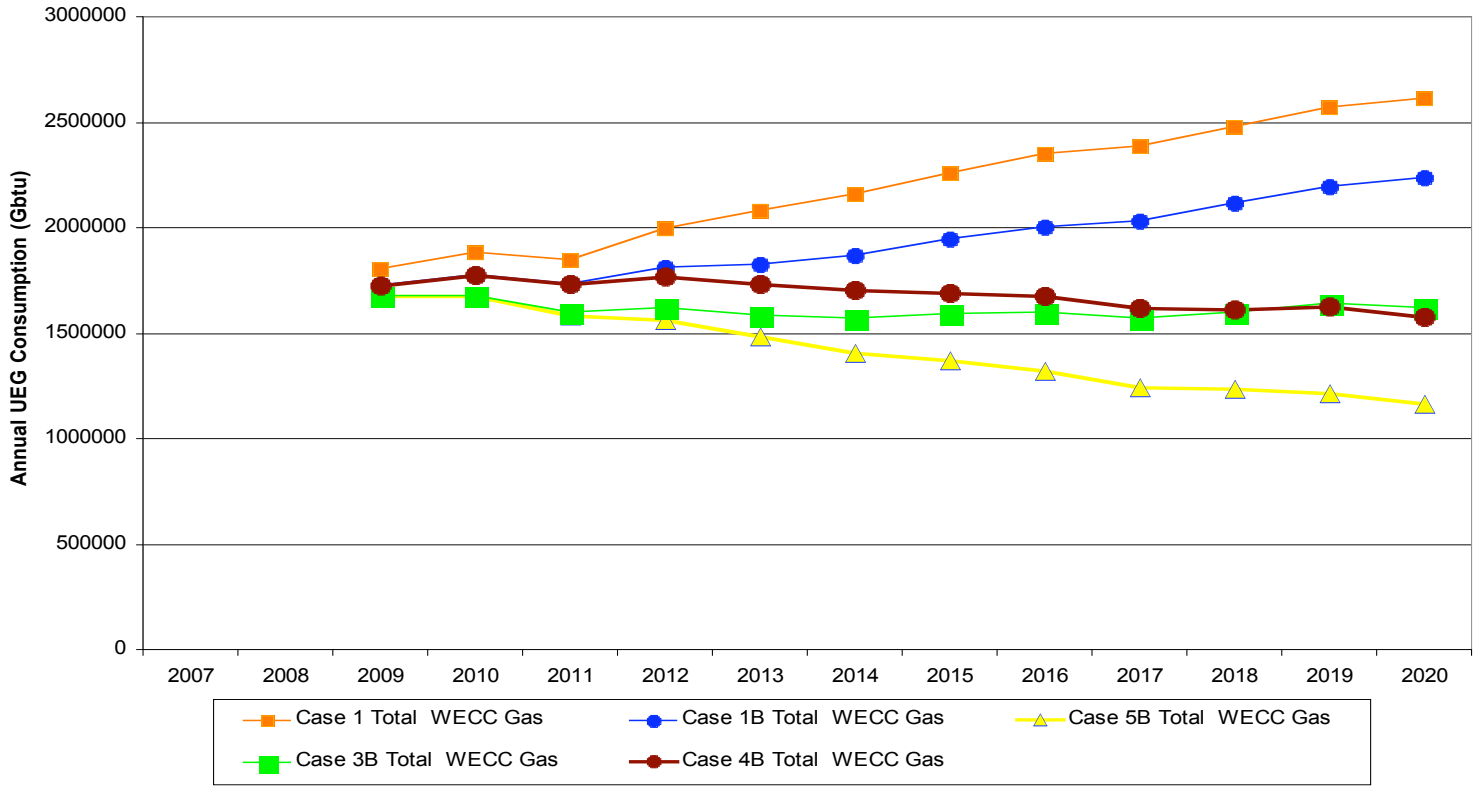


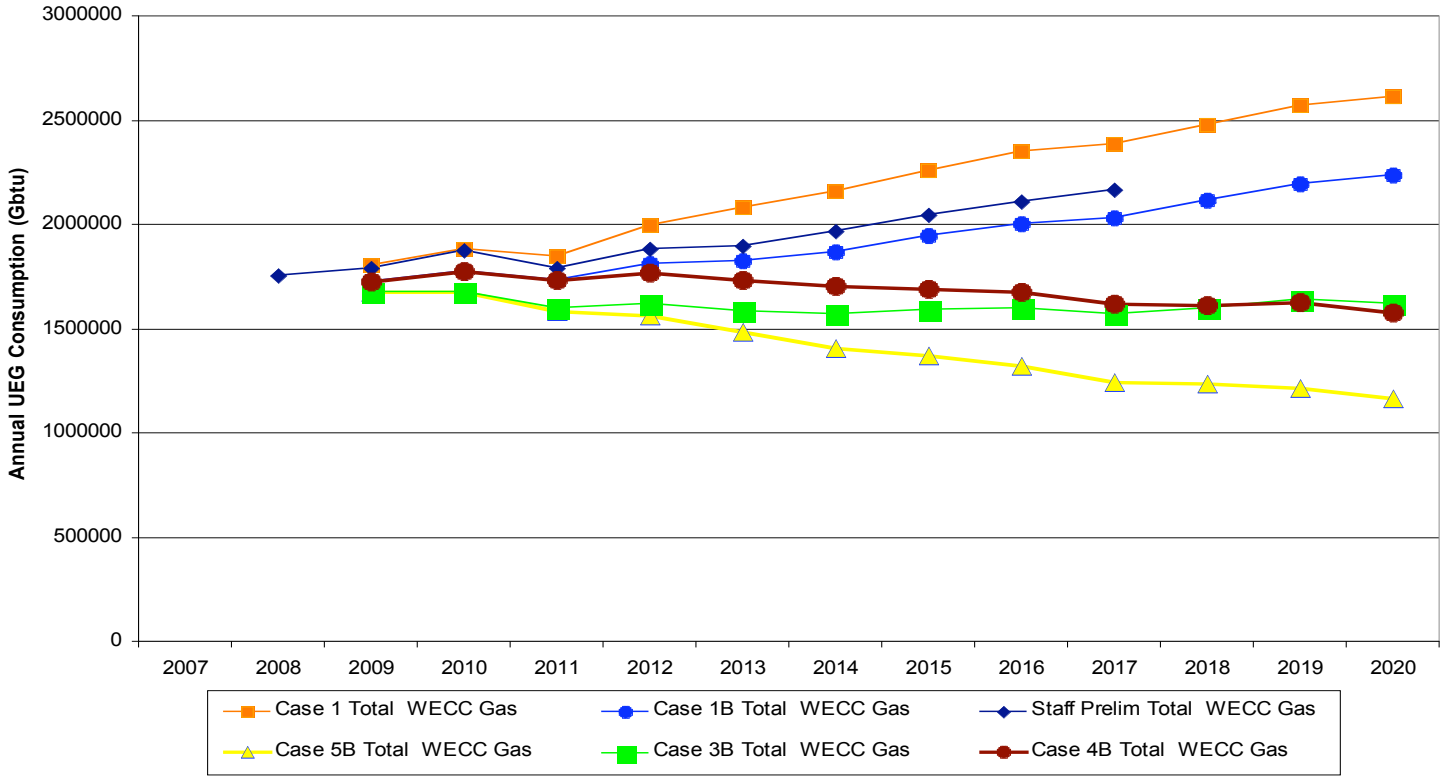
Figure 6-4: Composition of Generation to Meet Rest-of-WECC Load in 2020



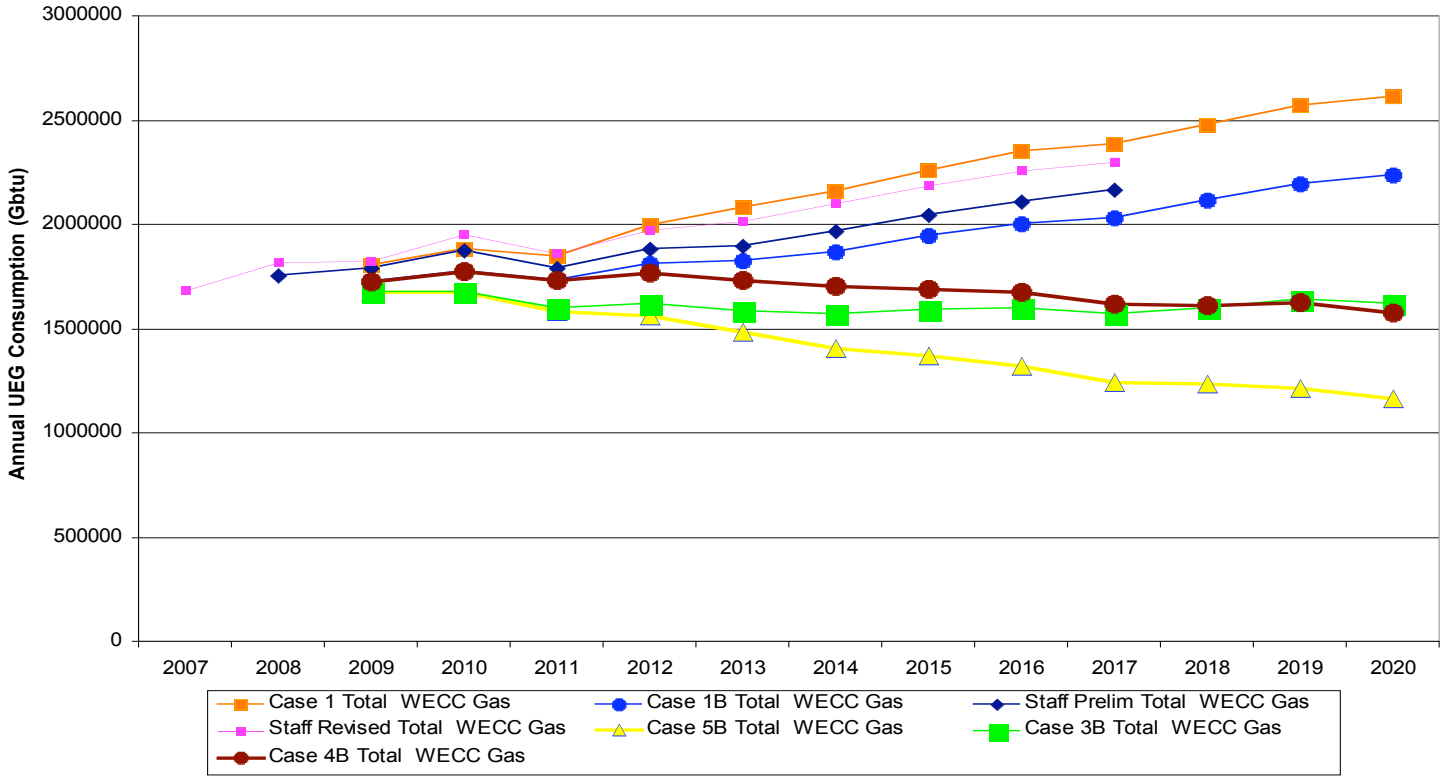
WECC-wide UEG for Scenario Cases



WECC-wide UEG for Scenario Cases Compared to Preliminary Analysis



WECC-wide UEG for Scenario Cases, Preliminary and Revised Analyses



Contrasting these Assessments

- The policy preferred cases clearly have lower UEG consumption than do Cases 1 and 1B, or the two versions of staff's reference assessment.
- All four of these are some version of business as usual, while the policy preference cases are predicated on a substantial change in course.

Impacts on Natural Gas Market Clearing Prices

- Reduction in Case 5B is a major portion of WECC-wide, and even national, gas demand
- Are there impacts on natural gas prices?
  - Previous studies have found an effect, but one with a very wide range
  - Staff commissioned Global Energy to determine the size of this impact
  - Global Energy analysts are here today to describe their approach and results